

**Missouri Soil and Water Districts Commission  
March 2003  
NEEDS ASSESSMENT,  
PLAN TO ADDRESS IDENTIFIED NEEDS &  
A SUMMARY TO DATE**

<b><i>EXECUTIVE SUMMARY</i></b>	<b><i>2</i></b>
<b><i>I. INTRODUCTION</i></b>	<b><i>3</i></b>
<b><i>II. BACKGROUND</i></b>	<b><i>4</i></b>
<b><i>III. SOIL AND WATER CONSERVATION NEEDS</i></b>	<b><i>5</i></b>
<b><i>IV. THE COMMISSION'S "PLAN FOR THE FUTURE"</i></b>	<b><i>9</i></b>
1. Reduce erosion on 95% of Missouri's agricultural land to a level considered acceptable by the year 2006.	10
2. Prevent water pollution caused by soil erosion and chemical runoff from agricultural land by expanding the Special Area Land Treatment (SALT) program.	16
3. Promote total resource management for agricultural land.	20
4. Help local people solve local natural resources problems by strengthening the role of Missouri's Soil and Water Conservation Districts.	21
5. Complete field work on Missouri's first generation soil survey by 2002; determine the state's role in the next generation soil survey, and in providing soil science assistance.	24
<b><i>V. SUMMARY</i></b>	<b><i>27</i></b>

**APPENDICES**

- A. Facts for Agriculture**
- B. Missouri's Rank Among States**
- C. Recent National Resources Inventory Data by Major Land Resource Area**
- D. Major Water Pollution Sources and Contaminants in Missouri Classified Waters**
- E. Public Drinking Water Grants**

**MISSOURI SOIL & WATER DISTRICTS COMMISSION: NEEDS ASSESSMENT,  
PLAN TO ADDRESS IDENTIFIED NEEDS, & A SUMMARY TO DATE  
March 2003**

**EXECUTIVE SUMMARY**

The Soil and Water Districts Commission is charged with conserving Missouri's soil and water resources for future generations through its work with local soil and water conservation districts. Missouri's economy is built on a strong agricultural foundation that generated \$4.82 billion in agricultural production during 2001 with a wide variety of crops and livestock.<sup>1</sup>

Prior to passage of Missouri's Parks and Soils Sales Tax in 1984, Missouri had the second worst erosion rate in the nation. Missouri reduced erosion on its agricultural land by 54% from 1982 to 1997 (the most recent data available) and by more than any other state. Recent trend data (NRCS - unpublished) indicate that the erosion rate in Missouri is continuing to fall.

Even with this success, there is much work yet to do. As of 1997, erosion was still above acceptable levels on 5 million acres. In order to reach our goal of 95% of Missouri's agricultural land eroding at "T" (tolerable levels) or better, we need to get down to only 1.3 million acres eroding above "T". In Missouri almost all the land with excessive erosion is cultivated cropland. The 1997 data also shows that reaching "T" on pasture and grazing is readily achievable with current practices and policies.

Also, agricultural impacts on water quality are significant and difficult to remedy. Sediment entering Missouri's waterways degrades water quality, carries agricultural chemicals, and clogs streams, rivers and lakes. Agricultural chemicals in water runoff also cause problems for drinking water supplies, recreation and other water resource needs.

In order to deal with these soil and water conservation needs, the Soil and Water Districts Commission developed its "Plan for the Future" in 1994. Since that time the Commission has been implementing the plan, monitoring its progress and making adjustments as needed. The 1997 National Resources Inventory data was released in December of 1999. The Commission is using this data to review progress in attaining their goals and to adjust programs as needed. The data released by NRCS indicate that 88% of the cultivated cropland that is still eroding above tolerable levels is concentrated in five Major Land Resource Areas (see Appendix C).

The Commission's "Plan for the Future" has five main themes that are discussed in this document:

1. Reduce erosion on 95% of Missouri's agricultural land to acceptable levels (T) by 2006.
2. Prevent water pollution caused by soil erosion and chemical runoff from agricultural land by expanding the Special Area Land Treatment program (SALT).
3. Promote total resource management for agricultural land.
4. Help local people solve local natural resources problems by strengthening the role of Missouri's soil and water conservation districts.
5. Complete fieldwork on Missouri's first generation soil survey by 2002; and determine the state's role in the next generation soil survey, and in providing soil science assistance.

---

<sup>1</sup> <http://agebb.missouri.edu/mass/farmfact/farmfact.htm>, Missouri Department of Agriculture and USDA, Missouri Agricultural Statistical Service, 2002.

## I. INTRODUCTION

The following provides an assessment of Missouri's soil and water conservation needs, the Commission's plan to address those needs and how that plan is being carried out. The commission's programs, administered through the local soil and water conservation districts, focus on Missouri's agricultural working lands using a voluntary approach to resource protection. Working together great progress has been made. With the continued support of Missouri's taxpayers, landowners, soil and water conservation districts, and other partners, this successful tradition of saving Missouri's soil and water for those who come after us will continue.

In 1982, prior to the first voter approval of the Parks and Soils Sales Tax, Missouri had the second highest rate of soil erosion in the nation. Productive farmland and the ability to feed future generations were being lost at an alarming rate. The voters approved the Parks and Soils Sales Tax in 1984; in 1988 - and by a 2-to-1 margin in 1996. This tax, scheduled to expire in 2008, has allowed Missouri to take positive steps toward **"the saving of the soil and water of this state for the conservation of the productive power of Missouri's agricultural land..."**.<sup>2</sup> Missouri has a diverse and balanced natural resource base that includes cropland, forestlands, and pasture and hay lands.

### Missouri Land Use 1997 <sup>3</sup>

<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>
Cropland	13,709,800	30.7
Conservation Reserve	1,606,700	3.6
Pasture	10,946,600	24.5
Rangeland	97,700	0.2
Forest Land	12,118,300	27.2
Federal Land	1,917,000	4.3
Other Rural	715,900	1.6
Developed	2,652,500	5.9
Water	<u>849,400</u>	<u>1.6</u>
TOTAL	44,613,900	100%

Missouri's economy is built on a strong agricultural foundation. Missouri's working lands generated \$4.82 billion in agricultural-related production in 2001.<sup>4</sup> (See also Appendices A and B and <http://agebb.missouri.edu/mass>.)

Since the Parks and Soils Sales Tax was approved by Missouri's voters in 1984, the program to save Missouri's soil and to protect the state's water has been one of the most admired and

---

2. From Missouri's Constitution, Section 47a, regarding the purpose of the soils portion of the Parks and Soils Sales Tax.

3 . 1997 Natural Resources Inventory; USDA; December, 1999.

4. *Missouri Farm Facts 2002*; Missouri Department of Agriculture and the U.S Department of Agriculture; See also <http://agebb.missouri.edu/mass>

respected of its kind in the nation. It has received several national and statewide awards. What follows is a summary of the soil and water conservation needs in Missouri, status of soil and water conservation and the plan developed by the Soil and Water Districts Commission to meet the identified needs. This plan represents Missouri's ongoing commitment to the land and to maintaining its bounty for future generations.

## **II. BACKGROUND**

The Commission approved the original "Plan for the Future" in 1994 and later updated the plan to extend protection to 95% of all of Missouri's agricultural land by 2006. This new goal went beyond the earlier goals of achieving protection on 85% of all cropland, and 95% of all pasture and hay land by 2000. The revision in the plan also incorporated the available National Resources Inventory numbers (1992 NRI Survey was made available in 1994). In 1995 the Commission approved a budget framework, showing how funds would be used to meet soil and water conservation needs. They also established conservation goals and strategies to achieve those goals. The plan was developed in cooperation with many interested Missouri citizens' groups that worked effectively for renewal of the Parks and Soils Sales Tax in 1996. Two-thirds of Missouri's voters supported renewal of this tax in the 1996 general election. The updated "Plan for the Future" will be discussed in Section V.

### **Issues: Conversion of Agricultural Land, Demographics and the Future**

#### **Agricultural Land Conversion**

"Missouri is losing ground – not to soil erosion or disputes over borders - but to urban development."<sup>5</sup> Between 1992 – 1997, 224,000 acres of Missouri agricultural land were converted to other uses (44,800 acres annually).<sup>6</sup> "USDA estimates that the United States loses about one million acres of farmland a year, two acres a minute, to urban sprawl. This volume of fertile topsoil lost to urbanization is roughly equivalent to that being saved by the federal Conservation Reserve Program (CRP)."<sup>7</sup> The commission is quite concerned about this loss of Missouri's productive farmland and has requested that staff review this with interested people and groups to see what role the Commission might play.

#### **Demographics**

Changes that could be quite significant for future program considerations are occurring (<http://www.oseda.missouri.edu/presentations>). People are moving into rural areas, impacting natural resources and making demands on local infrastructure. There is a great deal of speculation in regard to how these new residents will affect land-use decisions, local politics and state conservation needs. Other trends indicate that agricultural land is becoming increasingly owned by absentee landowners who provide very little input into how the land is managed. These trends and others will need to be carefully monitored in order to respond to resource conservation needs of the future.

---

5. Natural Resources Conservation Service, *Missouri Losing Ground to Urban Growth*; News Release, December 20, 1999.

6. 1997 National Resources Inventory (NRI) report, Natural Resources Conservation Service, USDA.

7. From the National Association of State Departments of Agriculture, NASDA Policy Statements – Conservation Resource Management, February 26, 2000; <http://www.nasda.org/policies/seven.htm>

### III.SOIL & WATER CONSERVATION NEEDS

#### A. SOIL EROSION

Missouri consists of a total of 44.6 million acres of land (agricultural, urban, water). Of these acres 26.3 million are considered agricultural land (cultivated cropland– 10.5 million; pasture plus hay land- 14.2 million; and Conservation Reserve Program land– 1.6 million). See also: <http://www.nrcs.usda.gov/technical/NRI/>. In 1997, 21.2 million (or 81%) of these agricultural acres were eroding at rates considered acceptable or better, and the remaining 5 million acres were eroding in excess of acceptable levels.<sup>8</sup> Pasture and hay land erosion were at “T” or better on 92.4% of the land in 1997. On cultivated cropland 62.7% of these were at “T” or better. These figures are based on the Universal Soil Loss Equation. NRCS data based on the more current Revised Universal Soil Loss Equation are pending.

**TABLE 1**

<b><i>STATUS OF SOIL AND WATER CONSERVATION IN MISSOURI</i></b> 1997		
Total acreage in Missouri	44.6 M	
Total agricultural acreage	26.2 M	61% of Missouri acres
Agricultural acres at “T”	21.2 M	81% of Ag. acres
Agricultural acres to treat (> T)	5.0 M	19% of Ag. acres
Year	Agricultural acres eroding Above acceptable (T) levels*	
1982	9.3 M acres	
1987	7.8 M acres	
1992	6.2 M acres	
1997	5.0 M acres	
<b>2006</b>	<b>1.3 M acres (Goal)</b>	

\*Sheet and Rill Erosion – does not include gully erosion. Source: USDA National Resources Inventory (NRI) data. - <http://www.nrcs.usda.gov/technical/NRI/>

The Soil Sales Tax Fund treated more than 2 million acres between fiscal years 1986 and 2001 through direct cost-share incentives. Many additional acres were treated without direct cost-share funding through education, demonstration practices and a general acceptance of practices due to their more widespread use. The districts, landowners and other conservation partners have made tremendous progress in advancing the voluntary adoption of these practices.

8. 1997 National Resources Inventory; United States Department of Agriculture; Dec. 1999

Average annual sheet and rill erosion has steadily declined since 1982. Table 2 provides Missouri's data for each year the NRI was conducted. Tables 2 and 3 and Appendix C provide information that is important in determining where the Commission needs to focus its resources during the next 3 years to reach it's goal of "T" or better on 95% of agricultural land by 2006. **NRCS NRI data indicate that 88% of the cultivated cropland eroding above T is concentrated in five Major Land Resource Areas.** <sup>9</sup> Initial indications from recent data collection are that Missouri continues to make good progress in reducing erosion. The next comprehensive NRI report is expected to provide better scientific data based on the Revised Universal Soil Loss Equation. This forthcoming data should give the commission a much better idea of what needs to be done to meet their erosion reduction goals.

TABLE 2: MLRA'S RANKED BY TOTAL ACRES (in thousands) ERODING ABOVE "T"

rank	mlra	acres eroding above "t"	acres of cultivated cropland	% of total cultivated cropland in mlra eroding above "t"	% of total state cultivated cropland eroding above "t"
1	113	877	1408	62%	22%
2	107	846	2076	41%	21%
3	109	797	1621	49%	20%
4	115	615	1579	39%	15%
5	112	382	930	41%	10%
<i>% of state total &gt; T for these 5 MLRAs</i>					<b>88%</b>

Table 3

Estimated average annual sheet and rill erosion on nonfederal land, by year						
State	Year	Cropland			CRP land	Pastureland
		Cultivated	Noncultivated (hay land)	Total		
		----- tons/acre/year -----				
Missouri	1982	10.9	0.9	9.6	----	2
	1987	8.4	0.7	7.5	6.4	1.7
	1992	6.6	0.7	5.6	1	1.6
	1997	5.6	0.6	4.4	0.7	1.3

9. 1997 National Resources Inventory; U.S. Department of Agriculture, 1999. Also - <http://www.nrcs.usda.gov/technical/NRI/>

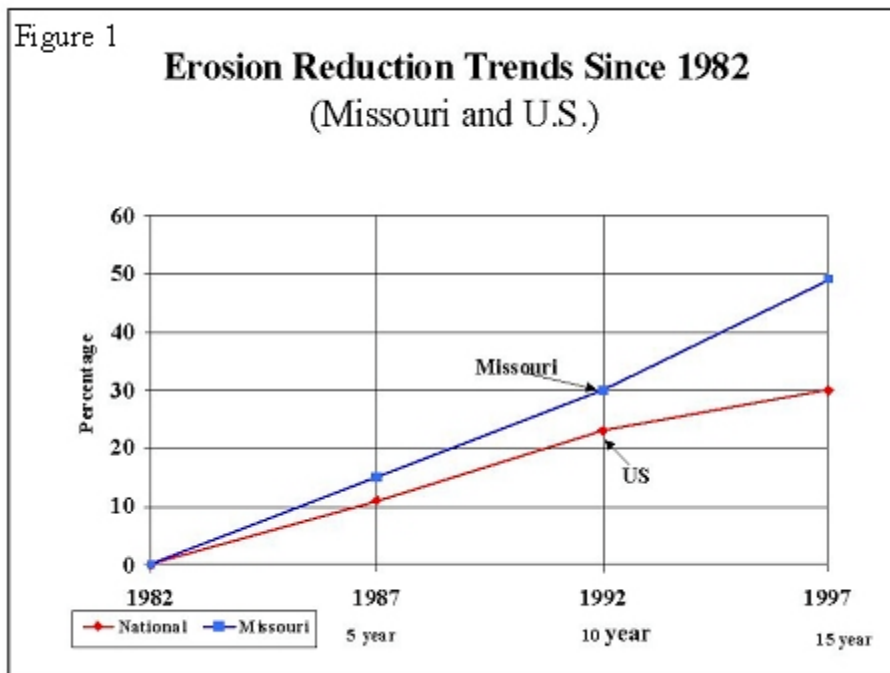


Figure 1 shows a fifteen-year comparison of Missouri versus the nation's trend in reducing soil erosion. Even though the national trend has begun to level off, Missouri continues to reduce soil erosion. We expect that the trend in Missouri will level off more as we get closer to the goal of "T" on 95% of Missouri's agricultural land. This will be monitored as more information is obtained.

## B. WATER QUALITY

The Commission, in its "Plan for the Future", has responded to the growing need to address the water quality issues within the soil and water conservation equation. Agriculture is totally dependent on water and in turn affects the quality and quantity of water leaving agricultural land. Conservation practices lead to greater water infiltration and less run off and erosion. Conservation practices hold water in the upland and release it more slowly into the watershed, increasing soil moisture, helping to grow crops and lessening downstream impacts such as flooding, sedimentation, and agricultural chemicals in the water.

About 59 million tons of soil erodes from Missouri's land each year. Much of that soil enters our waterways, clogging and filling streams, reservoirs and lakes. The severity of flooding is increased as these silt-laden waterways and reservoirs do not have the capacity to hold as much water as they would without the sediment.

The number one pollutant, by a very wide margin, entering Missouri's waters is

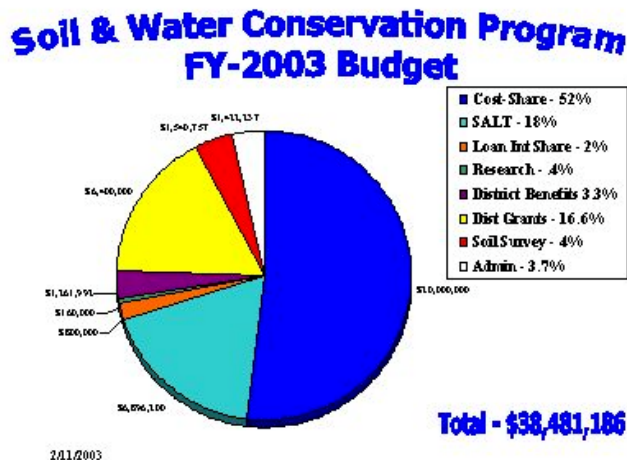
sediment (soil).<sup>10</sup> As soil is washed from the land, it takes other pollutants with it such as pesticides and fertilizers. Water washing over the land or through the soil can also carry dissolved chemicals. By keeping soil and water that contain agricultural chemicals from entering Missouri's streams, rivers, lakes and water supply reservoirs, we can protect the quality of Missouri's water. Water pollution from agricultural land is a large challenge to be addressed. The relative contribution of agricultural areas to stream and lake pollution is very significant.

Agriculture is a source of impairment for over 7,600 stream miles and 4,500<sup>11</sup> lake acres in Missouri (see Appendix D). Soil and water conservation practices can be used to address this kind of problem in a positive and productive way. One of the primary goals in the Commission's "Plan for the Future" is to *"improve, protect, and maintain the water quality of the state of Missouri through the prevention and reduction of nonpoint agricultural pollution using a watershed based approach."*

## C. BUDGET SUMMARY

### State Fiscal Year 2003 Budget

The fiscal year 2003 budget pie chart below reflects the Commission's request from last year for an additional \$500,000. The increase for District Assistance Operations Grants was initially requested by the Commission, but was not approved in the Governor's budget plan last year. This original plan did not initially receive approval because it involved potential employee pay issues for Districts when the state employee issues were basically frozen.



It was added into the budget later by a legislative committee and was in the final budget, which was approved by the Governor. The primary justification and need for

10 *Missouri Water Quality Report 2000*, Missouri Department of Natural Resources, Water Pollution Control Program

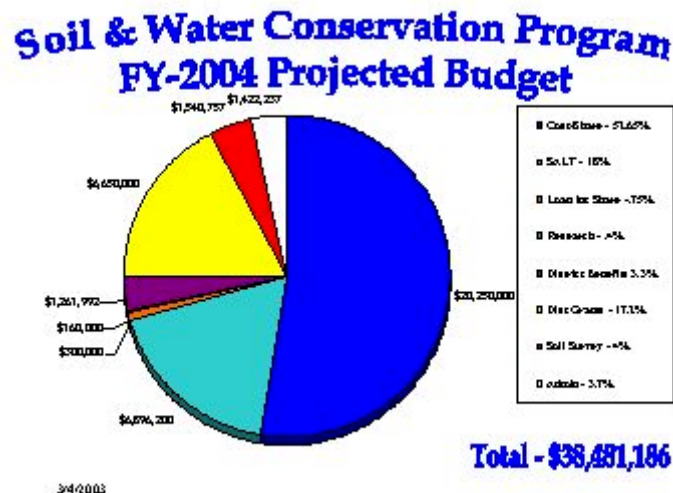
11 *ibid.*



the increase was to provide assistance to all districts to be able to hire and maintain adequate staffing at their office locations. Although personal service budget projections remained the same, the administrative expense and equipment appropriation was slightly reduced by transferring some of the support requirements to the new division's administration in the new Water Protection and Soil Conservation Division, and Department Regional offices for our employee and program needs. With the legislative inclusion of \$500,000 for the District Assistance Grants and a slight reduction for equipment and expenses, the FY 2003 approved budget was \$38,481,185. The appropriations for the cost-share program, loan interest share program, and research grants to Missouri colleges and universities have remained the same at \$20,000,000, \$800,000, and \$160,000 respectively. The Grants to districts appropriation was increased to a total of \$7,661,992 and the SALT program increased to \$6,896,200. A total appropriation of \$2,962,994 was approved for soil science and program administration. The revenues for the Soils Sales Tax have posted small but positive increases for the first half of 2003. Since the program budget has relatively remained the same, with the small exceptions noted, we have been able to continue the allocations for all programs without impact.

### State Fiscal Year 2004 Budget

The Soils Sales Tax is projected to continue to provide a stable revenue source for current programs and grants. The fiscal year 2004 budget pie chart reflects the Commission's budget request. The Commission has been reviewing the reduced demand for the Loan Interest Share Program and had considered a possible expansion for a farmland preservation program in 2004.



However, the overall state budget environment for 2004 was not favorable for any expansion requests. The Commission's contingency plan was used to request a core redirect of \$500,000 from the Loan Interest Share Program (with \$250,000 redirected to the successful Cost Share program and \$250,000 redirected to the District Grants

Program to strengthen district education and information activities). The request for FY 2004 is primarily the same as the approved budget for 2003 with no planned increases, but it does include redirecting the \$500,000 from the Loan Interest Share Program as discussed above. The Commission will monitor the success of the grant programs and may re-address the ability for the future expansion concepts in the FY 2005 budget.

#### **IV. THE COMMISSION’S “Plan for the Future”**

##### **A. INTRODUCTION – “Plan for the Future”**

The five main points to the Soil and Water Districts Commission’s plan to meet soil and water conservation needs in Missouri are:

- 1. Reduce erosion on 95% of Missouri’s agricultural land to a level considered acceptable by the year 2006.**
- 2. Prevent water pollution caused by sedimentation and chemical runoff from agricultural land by expanding the Special Area Land Treatment (SALT) program.**
- 3. Promote total resource management for agricultural land.**
- 4. Help local people solve local natural resources problems by strengthening the role of Missouri’s Soil and Water Conservation Districts.**
- 5. Complete fieldwork on Missouri’s first generation soil survey by 2002. Also, determine the state’s role in the next generation soil survey, and in providing additional soil science assistance.**

The Soil and Water Districts Commission, the districts, landowners, and other members of the conservation partnership are ready to address these interrelated natural resource needs of the 21st century - they represent Missouri’s continuing commitment to the land.

##### **B. STATUS AND SUMMARY – “Plan for the Future”**

- 1. *By the year 2006, reduce soil erosion on 95 percent of Missouri’s agricultural land to a level that is acceptable.*** – This is the first goal of the Commission’s “Plan for the Future”. This goal is for sheet and rill erosion on agricultural land.

###### **a) Erosion Control –Sheet and Rill Erosion**

The analysis done on the 1997 NRI is based on the use of the Universal Soil Loss Equation (USLE) and will eventually be based on the Revised USLE, or on the latest update to the prediction formula. This statistically-based prediction formula is being continuously improved. The refinements to the

soil loss prediction formulas could impact the commission's decisions on the programs used to treat erosion in Missouri.

What is acceptable erosion? "T", or the tolerable soil loss factor, is the maximum rate of annual erosion, in tons, that will permit crop productivity to be sustained economically over a long period of time. It indicates the soil's ability to erode without impacting the soil's productivity. The "T" factor on soils ranges from 1 to 5 tons per acre per year and is determined by NRCS from information collected by DNR and NRCS soil scientists.

Missouri has significantly reduced erosion on cultivated cropland. In 1982, cultivated cropland was eroding at 10.9 tons per acre per year. This number decreased to 8.4 tons per acre per year in 1987, 6.6 tons per acre per year in 1992, and 5.6 tons per acre per year in 1997. Even with this success, which is better than any other state, there are still an estimated 3.9 million acres of cultivated cropland eroding above tolerable levels (based on the 1997 NRI data).

The last table in Appendix C shows the different categories of agricultural land in the state and the percent treated at or below "T". Cropland and pastureland are the only two categories where excess erosion is still occurring. The Non-Cultivated Cropland, NCC or hayland and Conservation Reserve Program acres already exceed the 95% goal. Hayland is at 98.2% and CRP is at 97.7%.

Pastureland in the 1997 NRI consisted of 10.9 million acres with 90.7% of these acres at "T" or better. Due to the change to better science in calculating soil loss; the continued use of cost-share practices, including the planned grazing systems; and with farmers' efforts, the 95% goal on pastureland is readily achievable.

If the trend continues, there will still be 2.3 million acres of the state's cultivated cropland eroding over "T" at the end of 2006. Ninety one percent (91%) of the state's agricultural acres will be treated to "T" leaving us 4% short of the goal.

The NRI can provide information to assist the commission in determining where the greatest needs for state funds are located. The commission's cost-share funds have been allocated to the Major Land Resource Areas (MLRAs) with the most cultivated cropland eroding above acceptable levels. By focusing on sheet and rill erosion on cultivated cropland, the districts can have a significant impact on attaining the erosion reduction goals set out in the "Plan for the Future".

Gully erosion is also a significant problem in the state. Active gully erosion and the maintenance of existing practices will continue to be soil resource issues for the district to work on in the future.

**b) Ephemeral Gully Erosion**



The NRI does not include the statistics for soil loss resulting from ephemeral gully erosion and there are no current soil loss assessment programs that can be used to account for this problem. Based upon recent studies done on ephemeral gully erosion in 19 states, the amount of ephemeral gully erosion ranged from an additional 21 percent to 275 percent<sup>12</sup> of the estimated sheet and rill erosion on the field. Neighboring states ranged from an additional 31 percent in Iowa to 73 percent in Illinois. The extent of this type of erosion is not known in Missouri but is associated with highly erodible soils and can be significant depending upon climate, landscape, soil, and cultural factors. Ephemeral gully erosion may be a major source of erosion on existing farmland and can be treated by controlling surface water runoff with conservation practices. More information is needed on the extent of this problem in Missouri in order to determine the costs to treat the problem.

The Commission allows cost-share eligibility on terraces and diversions to be based on either ephemeral erosion or sheet and rill erosion. On occasion a field will have ephemeral erosion even though the sheet and rill erosion is not in excess of “T”. Soil and water conservation districts have the technical and financial ability to address ephemeral erosion with terraces and other practices.

**c) Maintenance of Existing Practices**

**i) *Acres Protected by Existing Conservation Practices***

---

12. *A Geography of Hope*; USDA; December 1996



Maintenance of soil erosion at tolerable levels or below is the cornerstone of the Commission's program. Thousands of practices have been installed over the last 50 years through federal incentive programs and various incentives the districts administer today. Many landowners have installed conservation practices without direct federal or state financing. All of the conservation work that has been accomplished must be maintained in order to continue the progress that has been made. Extending the life of existing practices through maintenance can substantially decrease the total cost of these practices over the years. A lesser incentive should be required to keep existing practices maintained. The Commission has also used cost-share funds to reconstruct storm-damaged practices to ensure the continued erosion control benefits from existing practices. The Commission has authorized the use of the reconstruction cost-share funding for all existing practices if requested by the districts. With the possibility of increased federal funding through EQIP, in the short term, district funding may not be needed on reconstruction.

*ii) Conservation Reserve Program Acres (CRP)*

One million seven hundred thousand acres of Missouri cropland has been protected by the CRP established over several years as part of the 1985 federal Food Security Act. Targeting highly erodible (HEL) cropland and other environmentally sensitive land has proven to be very popular with both the agricultural and environmental interests. Some of the land coming out of the CRP program may need conservation practices applied.

**d) Cost-Share**

For state fiscal year 2002, the Commission allocated half of the cost-share appropriation evenly among the 114 districts (geographic distribution). The remainder of the appropriation was allocated to the districts based on a needs distribution (amount of cost-share claimed by each district during fiscal years 1995-1997). Three million eight hundred thousand dollars remained from the FY 2002 cost-share appropriation and that amount was re-appropriated by the legislature for use in FY 2003.

During fiscal years 1997-2002, 736,650 acres were served by constructing 68,550 practices using state cost-share funds. During the life span of these practices, over 36.7 million tons of soil will be saved. The following table provides an 11-year history of the cost-share program.

<b>Table 3</b> <b>Cost-Share 1992 – 2001</b>						
<b>FISCAL YEAR</b>	<b>PROJECTED EXPENDITURE Million \$</b>	<b>ACTUAL EXPENDITURE Million \$</b>	<b>% TERRACES</b>	<b>% Erosion Control Structures and Ponds</b>	<b>% OTHER</b>	<b>TONS OF SOIL SAVED</b>
1992	20.0	20.6	48%	29%	23%	11,379,629
1993	20.0	15.3	41%	34%	25%	7,787,321
1994	22.5	18.6	52%	29%	19%	9,925,150
1995	21.5	21.2	48%	33%	19%	11,702,126
1996	26.5	25.3	45%	35%	20%	9,846,571
1997	24.0	27.9	42%	38%	20%	13,301,585
1998	20.7	20.9	27%	48%	25%	8,346,989
1999	19.8	14.5	42%	26%	32%	3,908,772
2000	19.5	19.0	36%	37%	27%	3,927,363
2001	23.0	17.4	36%	32%	32%	3,328,964
2002	22.0	21.8	38%	44%	18%	4,009,906

**e) Federal Initiatives and the CREP (Conservation Reserve Enhancement Program)**

Conservation Reserve Programs, such as CREP will continue to be available to the state. Missouri has put together a proposal and Memorandum of Understanding (MOU) to make the CREP program available to landowners in public drinking water watersheds. The CREP program has over 10,000 acres enrolled. Public drinking water systems will be paying landowners a one-time up front payment on the acres enrolled in the program.



Public drinking water systems have been approved for CREP grants in the amount of \$1,512,854. The Soil and Water Conservation Program is currently processing claims for an additional 25% cost-share on eligible cost-share practices through a pilot Special Area Land Treatment (SALT) program. This 25% is in addition to the federal 50% cost-share giving the landowner a total of 75% cost-share for eligible practices. In addition, the program will be working with the Missouri Association of Soil and Water Conservation Districts administering the Missouri Department of Conservation's additional incentive for wildlife-friendly seedings. This program will strengthen partnerships within DNR and other agencies, and will enhance development of new partnerships at the county level.

Riparian corridors offer a unique opportunity to have a positive impact on water quality resulting from agricultural non-point source pollution. Missouri has thousands of miles of pasture riparian corridors that could benefit from a CREP program. Other CREP opportunities will be evaluated and proposals may be developed in the next year.

**f) New Farm Bill - Impact of Increased Federal Funding through the Environmental Quality Incentive Program (EQIP) – for Agricultural Working Lands**

In addition to the pressing need for soil conservation work, districts have identified other resource concerns they would like to address with state cost-share funds. Districts are requesting cost-share funds for practices that do not reduce sheet and rill erosion to tolerable levels or do not control active gully erosion on agricultural land.

With proposed funding increases in the new federal farm bill, the commission may have the opportunity to meet the goals set in the "Plan for the Future" while also meeting other local natural resource needs. The new farm bill provides substantial funds for conservation measures on working lands through EQIP.

The increased funding in the federal farm bill can be utilized not only to help the commission reach its soil erosion control goals, but might also be

available to help meet other district resource concerns. The limiting factor for utilizing these funds will most likely be the need for technical assistance to do the necessary planning and technical work. With increased federal funding, the level of state cost-share and SALT that the districts use may differ from what they have historically used in the last five to ten years.

Because state funds can be re-appropriated, and available federal funds that are not obligated to landowners may be lost to the state, we expect that state taxpayers will want the commission to use federal funds before using state funds. Possible rules changes may need to be part of the commission's plan to utilize federal funds and keep competition between the state and federal programs to a minimum. Missouri's soil and water conservation districts have led the nation in providing landowners with incentives for conservation work.

The new farm bill will last through 2006. The current state sales tax for soil and water conservation and state parks will be collected through 2008. State and federal programs will need to continue to complement each other in order to get the most benefit from the available federal and state funding. Commission staff will continue to work with the NRCS, the Farm Service Agency, and other state and federal agencies on programs to best serve Missouri's citizens. Careful and prudent judgement must continue to be applied to the use of the taxpayers' money. The commission will continue to review the possibility of other state and federal programs to meet the needs of soil and water conservation on the agricultural working lands of Missouri.

The districts will continue to be the main local contact for both federal and state programs that fit into the overall soil and water conservation goals of the commission. Program staff will continue to inform the commission on any other opportunities that the new farm bill provides.

## ***2. Prevent water pollution caused by soil erosion and chemical runoff from agricultural land by expanding the Special Area Land Treatment (SALT) program.***

### **a) Background**

The Special Area Land Treatment (SALT) program was originally developed to allow local districts to target small watershed areas. The first projects began in 1986 and the program grew to include over 200 projects. The traditional SALT projects ended in FY2000 and the commission began focusing their attention on broadening the program to reduce agricultural nonpoint source pollution.

### **b) Agricultural Nonpoint Source Pollution (AgNPS) SALTs**

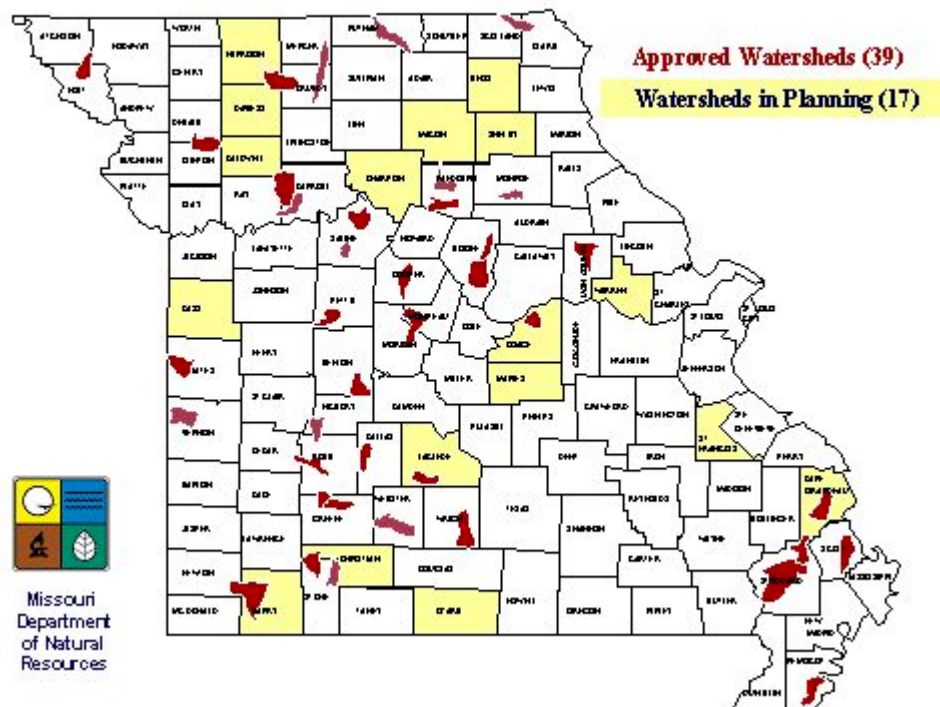
When the traditional Special Area Land Treatment (SALT) projects were



winding down, the Commission, in conjunction with other state and federal agencies, developed and began implementation of Agricultural Nonpoint Source SALTs. Availability of good water quality is a major natural resource concern and was a strong basis for the tax renewal. Nonpoint source water pollution, such as that which comes from agricultural lands over large watershed areas, has been identified as one of the primary threats to water quality. Therefore, the overall goal for the new SALT projects is to *“Improve, protect, and maintain the water quality of the state of Missouri through the prevention and reduction of nonpoint source agricultural pollution using a watershed-based approach.”*<sup>13</sup>

The concept of AgNPS SALT projects is to provide a basic level of resources to soil and water conservation districts (SWCDs) to provide landowners with tools to aid in the reduction and control of agricultural nonpoint source pollution in targeted watersheds. Local leadership is critical to the success of AgNPS SALT projects and is provided by a local project steering committee and the SWCD board. Local people solving local problems.

#### Agricultural Nonpoint Source (AgNPS) Special Area Land Treatment (SALT) Projects



There are currently 39 AgNPS SALT projects on-going around the state. There are also seventeen more projects in the final planning phases of their watershed plan. 12 of these proposals will be brought to the commission for

13. *Plan for the Future*; Missouri Soil and Water Districts Commission; June 1994

consideration at the May 2003 commission meeting. The projects that receive approval will start implementation in July of 2003. The commission has established a maximum budget of \$750,000 over the life of each project; a period of no less than five, but no more than seven years and a targeted watershed size of from 20,000 to 60,000 acres.

The watersheds are located throughout the state (see map). With approval of an expansion request last year, the commission can now fund at least 66 AgNPS projects before the sunset of the tax. The next call for proposals will be July 2003 with an implementation target date of July 2004. The commission has also authorized a call for a pilot forestry project using incentives developed by an interagency forestry committee (MDNR, MDC, and MO Dept. of Agriculture). The expected implementation date for this project is July 2003.

AgNPS SALT projects are developed with goals that address all components of AgNPS pollution, including soil erosion. Identified AgNPS problems might include contaminated drinking water, stream degradation, sedimentation of lakes, or otherwise contaminated lakes or streams. Goals of the AgNPS SALT projects include, but are not limited to: reducing pesticide and nutrient runoff from cropland, improving pasture management, reducing soil erosion from agricultural land, improving animal waste management, protecting and enhancing riparian corridors, and raising awareness of agricultural nonpoint source water pollution issues.



Partnerships are another key element in ensuring the success of these projects. Partners routinely include the Natural Resources Conservation Service (NRCS), University of Missouri Outreach & Extension, Missouri Department of Conservation (MDC), agribusinesses, private foundations, and other local, state and federal government agencies. Partners may be enlisted to help district personnel write a Watershed Plan, or the district may use other agencies' programs to complement the planned goals of an AgNPS SALT project. Examples of partner projects might include NRCS's Environmental Quality Incentives Program (EQIP), Water Pollution Control Program's Section 319 grants and Clean Lakes projects, and MDC's wildlife incentive and riparian improvement programs.

Last year's SALT expansion request covered expenses associated with the Missouri Conservation Reserve Enhancement Program (MoCREP), which is designed to use a combination of state, local, and federal funding sources to improve the water quality in public drinking water lakes. Fifty thousand acres of cropland in drinking water lake watersheds are eligible for a combination of local, state, and federal incentives. The cropland acres enrolled in the program are protected from erosion and other agricultural nonpoint source problems for a period of up to 15 years. The 25% cost-share incentive offered on eligible MoCREP Cost-share practices is paid when the practice is completed. Based upon the estimated costs of the practices eligible, it is estimated that the 25% landowners' share on practices offered in the program could cost as much as \$2,187,500, maximum, for 50,000 acres. The soil and water conservation program is currently processing claims for the additional 25% cost-share on eligible MoCREP practices through the SALT program. This 25% is in addition to the federal 50% cost-share giving the landowner a total of 75% cost-share for eligible practices.

The SALT MoCREP program has over 10,000 acres enrolled. Public drinking water systems will be paying landowners a one time up front payment on the acres enrolled in the program. Source water protection plans are required for the drinking water system to receive grants to pay an additional per acre incentive to landowners. Thirteen public drinking water systems have been approved for CREP grants by DNR's Public Drinking Water Program in the amount of \$1,558,862 (See Appendix E for Status). In addition, program staff is assisting the Missouri Association of Soil and Water Conservation Districts with administering the Missouri Department of Conservation's additional \$20 per acre incentive up to a maximum of \$100,000 for wildlife friendly seedings. This program has strengthened partnerships within DNR and other agencies, and is resulting in new partnerships being developed at the county level.

The development of riparian corridors offers a unique opportunity to have a positive impact on water quality resulting from agricultural non-point source pollution. Missouri has thousands of miles of pasture riparian corridors that could benefit from a CREP program. The SALT program watershed concept and the CREP could be used with other partners to develop and improve riparian corridors and protect water from the effects of agricultural non-point source pollution. Other CREP opportunities will be evaluated and proposals may be needed and developed in the future.

### **3. *Promote total resource management for agricultural land.***

#### **a) Background**

The Commission's "Plan for the Future" states, that "...rather than fixing a part of the soil conservation problem, the Commission hopes to encourage landowners to look at their total farming operations to establish the most appropriate resource management system for their farms." The Commission promotes total resource management of agricultural land and encourages soil and water conservation districts and the other conservation partners to implement science-based farm conservation systems. Each landowner has a different vision – his or her own Garden of Eden – that they are trying to achieve on their land. To move that vision toward reality, each landowner requires a different set of tools. A wide variety of tools are available to address individual landowner concerns through the local soil and water conservation district. New tools may be available in the new federal Farm Bill, and new challenges in learning how to use them properly.

#### **b) Loan Interest-Share Program (LISP)**

Currently the LIS program is funded at \$300,000 per year to allow landowner rebates on a portion of the interest paid for conservation practices and equipment purchased through local lending institutions. Landowners use this for farm equipment or to install practices that are needed to carry out their conservation plans. The loan program can address resource and financial needs that are unmet by other state and federal programs. Previously the program was funded at \$800,000 per year, but because it was not being fully utilized, the Commission requested that \$500,000 of these funds be re-directed into competitive district grants and for additional cost-share funding.

#### **c) Research**

Several research grants are now being funded through the Soil and Water Conservation Program. There have been a variety of topics researched including improving the delivery of conservation programs, evaluating possible new conservation practices, soil phosphorus, capacity-building in districts and determining where productive farmland is being lost. The most recent project is intended to improve the Commission's ability to better

identify critical issues and respond to changing soil and water conservation needs with appropriate planning efforts and programs. The research process is being reviewed to see if procedures might be improved. A more defined, project-based research process is being considered. Coordination with other agencies and programs in their areas of interest will be central to this process. It is anticipated that a Project Steering Committee will be formed for each project selected by the Commission and that the committee and the university will work together to develop and carry out these research projects.

**4. *Help local people solve local natural resources problems by strengthening the role of Missouri's Soil and Water Conservation Districts.***

**a) Background**

The hub for conservation work in Missouri is at the local soil and water conservation district. The resources are gathered, coordinated and provided to the landowners from the district office.



There are 114 soil and water conservation districts in Missouri. Each district has four elected board members and one ex-officio member (University of Missouri Extension). The elected board members are required to be landowners. The board administers the soil and water conservation programs in each district and the district may employ staff as determined by the district board. Eight DNR District Coordinators assist their assigned districts in preventing problems, solving problems, and administering the state's soil and water conservation programs.

The Natural Resources Conservation Service (NRCS) provides the technical base upon which the conservation program is built. They provide standards, data, technicians, guidelines and a wide variety of technical services to Missouri's conservation effort. NRCS also provides office space and phone service for the majority of soil and water conservation districts. Other partners in this cooperative effort include the Departments of Conservation and Agriculture, and many others.

**b) Service Delivery to Missouri's Citizens**

The soil and water conservation districts are the delivery mechanism for a variety of conservation programs. These district offices provide the local infrastructure that supports the concept of local people solving local natural resource problems in Missouri. In addition to administering the state cost-share program, the districts administer conservation demonstration programs; provide education to landowners, local officials, school children, and others; cooperate with the Department of Conservation on their private lands initiatives; and provide local expertise to landowners, citizens and local officials on numerous natural resources issues. By working cooperatively with a wide range of natural resource agencies and programs, the soil and water districts provide for a very cost-effective and coordinated approach to meeting conservation and natural resources needs at the local level.

In most districts, the offices are housed at a USDA Service Center. In 1995, USDA closed 13 offices, which meant the soil districts either moved the office to a neighboring county or opened an independent or stand-alone office. It is expected that nationwide, USDA will be closing 200 more offices in 2003. Missouri will probably have 5-10 closures. The soil districts where the impacted offices are located will have to either relocate and share office space in a neighboring county - or establish their own offices. This process will require extensive communication and coordination with the affected boards and their staffs while ensuring the continued delivery of services to landowners.

**c) District Leadership**

District boards and employees regularly request training to develop skills to more effectively administer district programs.

Boards have also reported a need for leadership development opportunities to help members be more comfortable in their roles on the boards. To respond to these needs, the Missouri Association of Soil and Water Conservation Districts (MASWCD) established a committee several years ago to develop a training. The training plan was approved by MASWCD and accepted by the Soil and Water Districts Commission to meet training needs.





The primary group training opportunities for district boards and their employees are at the training conference in the winter and the area meetings in the summer. Individual training takes place year round on an as needed basis. The training plan is used as a reference throughout the year in developing both group and individual training sessions. In addition to the two primary training opportunities, the plan is also consulted to offer additional group training, as time and schedules permit. The plan is periodically reviewed and updated to ensure that current topics are made available at appropriate opportunities and that new topics are added as needed.

**d) District Audits**

All 114 soil and water conservation districts have been audited through the contract audit process. Staff will continue to look at previous audits to determine training needs for district supervisors and employees. A new contract is being developed to begin a second round of audits using a two-tiered audit plan. All audits will have a base level of review with the potential to delve into records more thoroughly if significant findings are identified. Staff anticipates 30-35 districts per year will be audited with the next contract.

**e) District Assistance Grants**

The Soil and Water Districts Commission has proposed a core redirect of \$500,000 from the Loan Interest Share Program. If this redirect is approved through the appropriations process, \$250,000 will be directed to Grants to Districts to increase information and education activities in the local soil and water conservation districts. The purpose of this grant is to provide a competitive information and education assistance program for innovative and pilot educational efforts. It will also be used to promote awareness of all aspects of program activities in the districts and to help form partnerships with local stakeholders. The remaining \$250,000 will be redirected to the Cost Share Program.

**f) Farm Bill**

The new 2002 federal Farm Bill will have a major effect on the soil and water conservation districts. When federal funding is appropriated to support the provisions of the Farm Bill, it is anticipated that the workload in the districts will increase. To be prepared for these impacts, program staff has been participating in planning meetings regarding implementation. One of the provisions of the Farm Bill allows for the use of technical service providers (TSP) to assist with technical issues for landowners. As the final guidelines are not yet in place, it is difficult to determine the impacts TSPs will have on the current operations of the districts. The availability of TSPs is expected to increase the time available to districts for conservation plan development but will also require quality assurance monitoring of the participating TSPs.

**g) Information Dissemination**

Educating both youth and adults about the importance of the responsible use of our soil and water resources is an important priority. However, there is a lack of resources to adequately do this and to successfully report to Missouri's citizens about the accomplishments of the Soils Sales Tax.

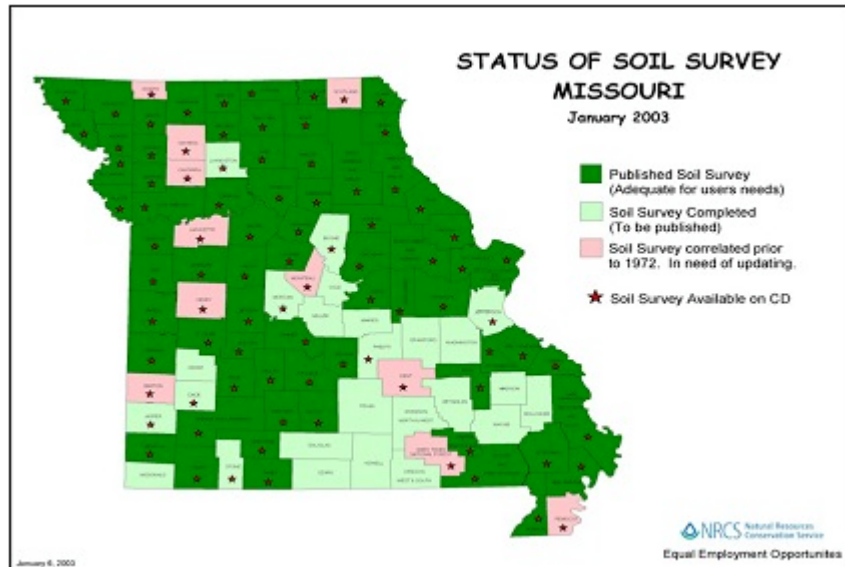
To be effective with both of these objectives, an existing position has been reallocated to assist the current person handling these responsibilities. The current position will be responsible for the educational activities and promotions for the Soil and Water Conservation Program. The other position will act as a public information specialist to develop the direct communications links with the media while assisting local soil districts in their efforts to increase visibility within their own locales.

**5. *Complete field work on Missouri's first generation soil survey by 2002; determine the state's role in the next generation soil survey, and in providing technical soils assistance.***

**a) Background**

The inventory and interpretation of Missouri's soil resource is the scientific basis for soil and water conservation practices. This knowledge is also critical for local conservation planning, watershed projects, development, and a variety of other uses. Scientifically gathered and documented soils information is needed in order to understand and conserve the soil - and to protect the resources that depend on this basic resource.





The initial inventory of Missouri's soil resource was completed in December 2001. Follow-up work continues, however, to get the collected data processed and made available to the public. The Soil and Water Districts Commission endorsed DNR's participation in the next generation survey and in providing additional soil science assistance to districts, landowners and others.

Missouri's soil resources are surveyed, sampled, documented and interpreted by a team of DNR and Natural Resources Conservation Service (NRCS) soil scientists. Soil samples are analyzed by the University of Missouri's Soil Characterization Laboratory. The Center for Agricultural, Resources and Environmental Systems (CARES) develops maps and databases from the data collected by DNR and NRCS soil scientists. Results of the surveys are published and made available to the public. These cooperative efforts have resulted in one of the best soil science programs in the country.

Now a compact disk version of surveys is being provided to the public within months of the data being processed, as opposed to several years for the soil survey books. As of early this year (2003) all published surveys, including those out of print, are now available in the CD format. Several unpublished surveys are also available in this format. In addition most of the surveys are available on the Internet at the digital soils site.  
<http://soils.missouri.edu/>

**b) Status of Soil Science Activities**

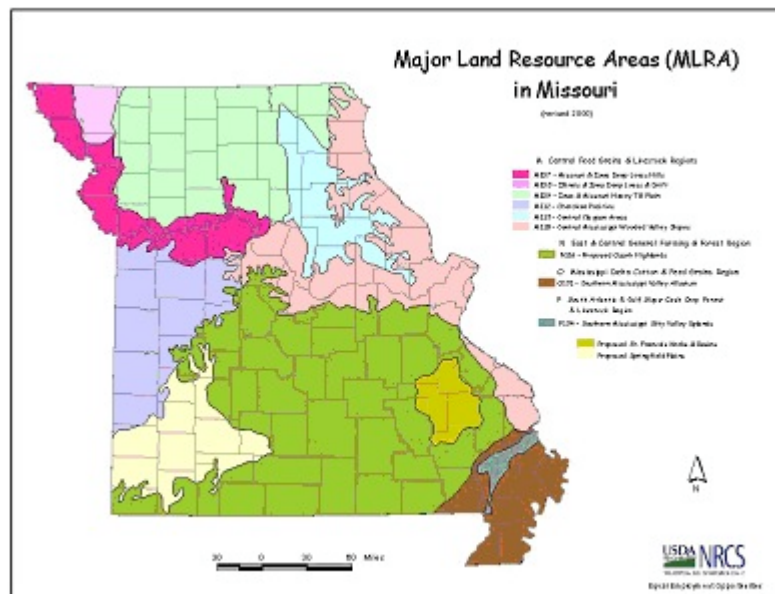
The data from the completed fieldwork is now being developed for publication (digital map development, data entry, developing interpretation

tables, etc.). Also, existing data and information are being evaluated in order to provide better information to the districts and landowners and to lay the groundwork for a comprehensive update of the survey. NRCS and DNR soil scientists are currently doing this evaluation throughout Missouri. The soil scientists are also involved in several projects where soils data are being collected. This data will improve the database and provide for better interpretive information being available to districts, landowners and others.

Next will be to bring the data together and to use all available data to improve the current soil science products. This will involve developing new legends (indices) of soils using Major Land Resource Area boundaries. It will involve evaluating data gathered across several counties over time to see if this data can be used to populate databases for areas that need further documentation. Soil maps will be evaluated to see if changes need to be made. Some of this will require extensive fieldwork for verification and correction and some may be done fairly simply. This initial process (Phase I Update) is expected to take about three years of work by the NRCS and DNR soil science team.

**c) Major Land Resource Areas -**

During the past several years, soil surveys in Missouri have been based on Major Land Resource Area (MLRA) boundaries as opposed to county lines. This has allowed the soil scientists working on these surveys to make better, more useful maps. Future updates of soils information throughout Missouri will be based on Major Land Resource Areas.



**d) Soil Science Assistance**

The DNR and NRCS soil scientists have been relocated to their respective offices and are engaged in their new responsibilities. One of the high priority issues is to provide more soil science assistance to local conservation districts and landowners. Some of these activities include watershed projects, conservation practices (such as siting of ponds), and information and educational activities. As they complete their transitional duties the DNR soil scientists will be working more closely with the NRCS Area Soil Scientists and the DNR district coordinators on these activities. DNR and NRCS soil scientists are also developing training programs for district staff, NRCS and DNR staff and other partners to improve our understanding of soil science, the value it has in conserving soil and water resources and how to apply soil science to natural resource questions.

Other programs include soil science presentations to schools, presentations to vocational agriculture teachers, soil judging contests and participation in Envirothon competitions.

## **SUMMARY**

Soil and water conservation has made tremendous progress in Missouri during the past 16 years as documented by the National Resources Inventory. Missouri has reduced erosion on agricultural land more than any other state. With their support of the Parks and Soils Sales Tax, Missouri's citizens have put a great deal of trust in this program. There is much work that remains to be done, however:

- erosion control – getting erosion to “T” on 95% of Missouri’s agricultural land by 2006 – there are currently 5 million acres eroding above T. In order to reach the goal, an additional three million acres of cultivated cropland will need to be brought to T or better by 2006;
- preventing agricultural nonpoint pollution by working with landowners and districts in Special Area Land Treatment watersheds;
- improving water quality by keeping soil, nutrients and chemicals on the land;
- solving local natural resources problems through strong, efficient, and effective Soil and Water Conservation Districts;
- documenting and understanding the soil resource through scientific surveys; and providing soil science interpretations and assistance for conservation needs to districts and landowners.

These various needs remain to be addressed by the Soil and Water Conservation partnership in Missouri. The continued support of Missouri’s landowners, conservation districts, and citizens will keep this work on track. The Soil and Water Districts Commission, with the help of citizens from around the state, continues to use and refine its “Plan for the Future” to address these needs and to make Missouri’s continuing commitment to the land a reality.

S:\Public\PLAN\Plan 2003\2003 needs assessment.doc

## Appendix A.

### FACTS FOR AGRICULTURE

<http://agebb.missouri.edu/mass/farmfact/farmfact.htm>

Agriculture continues as a solid base for the economy of Missouri. The State's 108,000 farms produced and sold about \$4.82 billion worth of crops, livestock, poultry and aquaculture in 2001, up 3 percent from 2000. Livestock and poultry accounted for about 56 percent of the agricultural output, down 2 percentage points from 58 percent in 2000 while crops made up the other 44 percent of the total.

The wide range of climate, topography and availability of irrigation water in the State results in considerable variability in crops produced. Soybeans and corn are by far the dominant crops in Missouri, being particularly important in the northern half of the State and in the southeast (Bootheel). The Bootheel is the most intensively cropped area with its high percentage of tillable, level land, long growing season and plentiful irrigation water. Cotton and rice are predominant crops in some southeastern counties. Hay is the most widely produced crop, ranking third in total value in the State, although normally only about 10 percent of the hay is sold. Hay is easily the major crop in the southwest and south-central districts where tillable land is limited, while a major proportion of farms in the rest of the State also raise hay.

Missouri is one of the leading livestock states in the nation. Cow- calf production fits in with crop production on many farms across the State, but beef operations are of major importance in the central, southwest, and south-central districts. Hog production is also widespread, but especially concentrated in the north-central and west- central districts. Broilers and turkeys are dominant in the southwestern counties.

Note the importance of Missouri to the nation's agriculture as shown by the following:

- ***NINE* percent of the U.S. TURKEYS are raised in Missouri.**
- ***SIX* percent of the U.S. SOYBEANS are grown in Missouri.**
- ***SIX* percent of the U.S. CATTLE OPERATIONS are in Missouri.**
- ***FIVE* percent of the U.S. FARMS are in Missouri.**
- ***FOUR* percent of the U.S. HOG OPERATIONS are in Missouri.**
- ***FOUR* percent of the U.S. GRAIN SORGHUM is grown in Missouri.**
- **Missouri is the *SECOND* leading state in BEEF COWS.**
- **Missouri is the *SECOND* leading state in NUMBER OF FARMS.**
- **Missouri is the *SECOND* leading state in HAY PRODUCTION (excluding alfalfa).**
- **Missouri ranks *SIXTH* in RICE PRODUCTION.**
- **Missouri ranks *SEVENTH* in SOYBEAN PRODUCTION.**
- **Missouri ranks *NINTH* in CORN PRODUCTION.**
- **Missouri ranks *TENTH* in WATERMELON PRODUCTION.**
- **Missouri ranks *TENTH* in COTTON PRODUCTION.**
- **Missouri ranks *ELEVENTH* in WINTER WHEAT PRODUCTION.**
- **Missouri ranks *THIRTEENTH* in GRAPE PRODUCTION.**
- **Missouri ranks *FIFTEENTH* in CASH RECEIPTS.**
- **Missouri ranks *NINETEENTH* in MILK PRODUCTION.**

Missouri Agricultural Statistics Service  
Missouri Farm Facts

## Appendix B.

### Missouri's Rank Among States 2001

	RANK	UNIT	TOTAL	PERCENT OF U.S. TOTAL
	-----	-----	-----	-----
<b>General</b>				
Farm Numbers	2	<i>farms</i>	108,000	5.0
Cash Receipts 1/	15	<i>billion dollars</i>	4.82	2.4
<b>Crops</b>				
Hay, excluding alfalfa	2	<i>tons</i>	6,480,000	8.5
Sorghum, grain	4	<i>bushels</i>	20,680,000	4.0
Hay, all	5	<i>tons</i>	7,853,000	5.0
Rice	6	<i>hundredweight</i>	12,317,000	5.8
Soybeans	7	<i>bushels</i>	186,200,000	6.4
Corn for grain	9	<i>bushels</i>	345,800,000	3.6
Cotton	10	<i>bales</i>	695,000	3.4
Watermelon	10	<i>hundredweight</i>	1,150,000	2.8
Winter wheat	11	<i>bushels</i>	41,040,000	3.0
Cottonseed	11	<i>tons</i>	268,000	3.6
Grapes	13	<i>tons</i>	300	0.04
Tobacco	14	<i>pounds</i>	3,081,000	0.3
Apples (utilized commercial)	15	<i>pounds</i>	41,000,000	0.4
Sorghum, silage	16	<i>tons</i>	24,000	0.6
Peaches (utilized commercial)	19	<i>pounds</i>	9,000,000	0.4
Alfalfa hay	21	<i>tons</i>	1,373,000	1.7
Potatoes, all	21	<i>hundredweight</i>	1,904,000	0.4
Oats	24	<i>bushels</i>	1,000,000	0.9
Corn silage	26	<i>tons</i>	1,120,000	1.1

1/ Preliminary.

2/ Inventory on hand January 1, 2002.

3/ Inventory on hand December 1, 2001.

4/ Inventory on hand December 1, 2001 (excludes commercial broilers).

## Appendix B. (cont.)

### Missouri's Rank Among States

### 2001

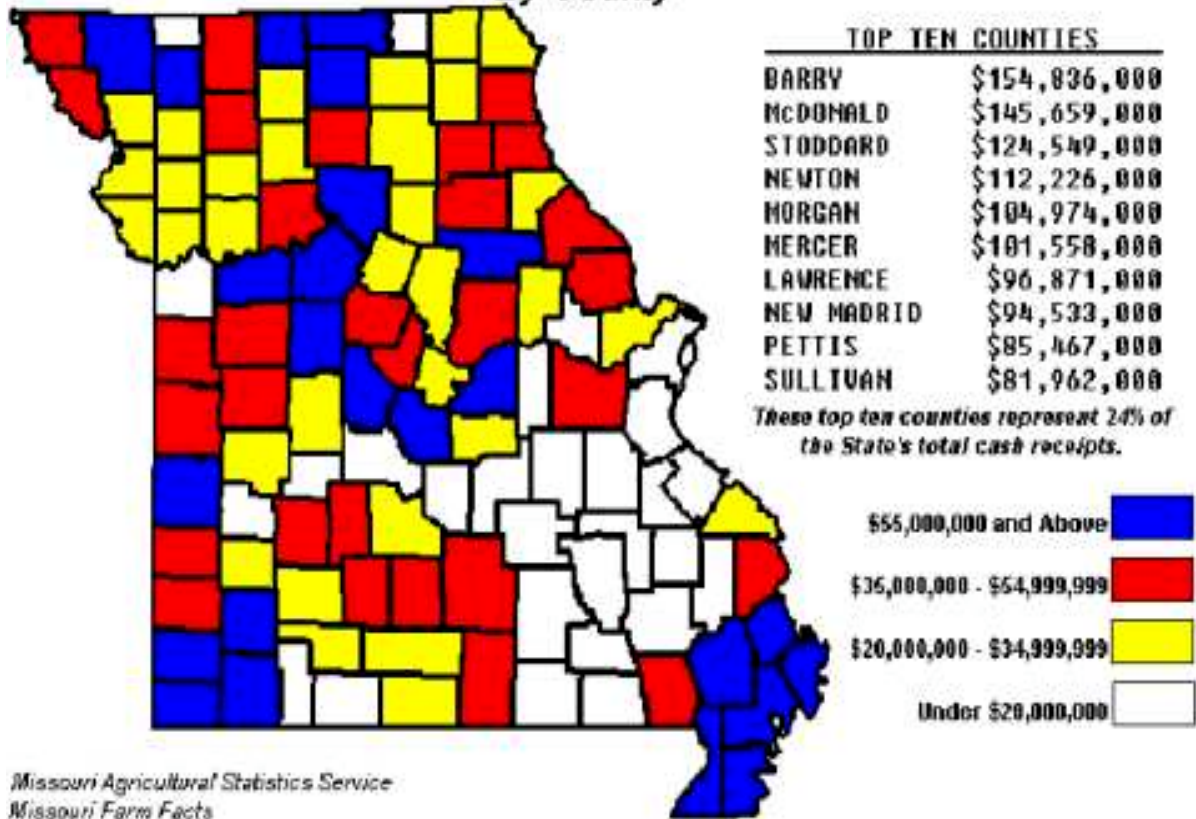
Livestock & Livestock Products				
	RANK	UNIT	TOTAL	PERCENT OF U.S. TOTAL
	-----	-----	-----	-----
Beef cow operations	2	<i>number</i>	57,000	7.0
Cattle operations	2	<i>number</i>	67,000	6.4
Beef cows 2/	2	<i>head</i>	2,060,000	6.2
Calf crop	2	<i>head</i>	2,060,000	5.4
All cows 2/	3	<i>head</i>	2,220,000	5.2
Turkeys raised	4	<i>head</i>	24,000,000	8.8
Milk cow operations	6	<i>number</i>	3,700	3.8
Hogs & pigs 3/	6	<i>head</i>	3,000,000	5.1
Cattle & calves 2/	6	<i>head</i>	4,350,000	4.5
Ice cream (low fat production)	7	<i>gallons</i>	21,215,000	5.2
Hog operations	9	<i>number</i>	3,100	3.8
Total cheese production	12	<i>pounds</i>	99,104,000	1.2
Ice cream (regular production)	13	<i>gallons</i>	22,148,000	2.3
Egg production	14	<i>millions</i>	1,789	2.1
All chickens 4/	15	<i>head</i>	8,462,000	1.9
Milk cows 2/	16	<i>head</i>	140,000	1.5
Sheep operations	16	<i>number</i>	1,700	2.6
Red meat production	17	<i>pounds</i>	636,400,000	1.4
Milk production	19	<i>pounds</i>	1,949,000,000	1.2
Cattle & calves on feed 2/	21	<i>head</i>	70,000	0.5
Honey production	21	<i>pounds</i>	1,525,000	0.8
Sheep & lambs 2/	22	<i>head</i>	70,000	1.0
Wool production	24	<i>pounds</i>	390,000	0.9

---

Missouri Agricultural Statistics Service  
Missouri Farm Facts

[General Information Page](#)

## 2000 Cash Receipts By County

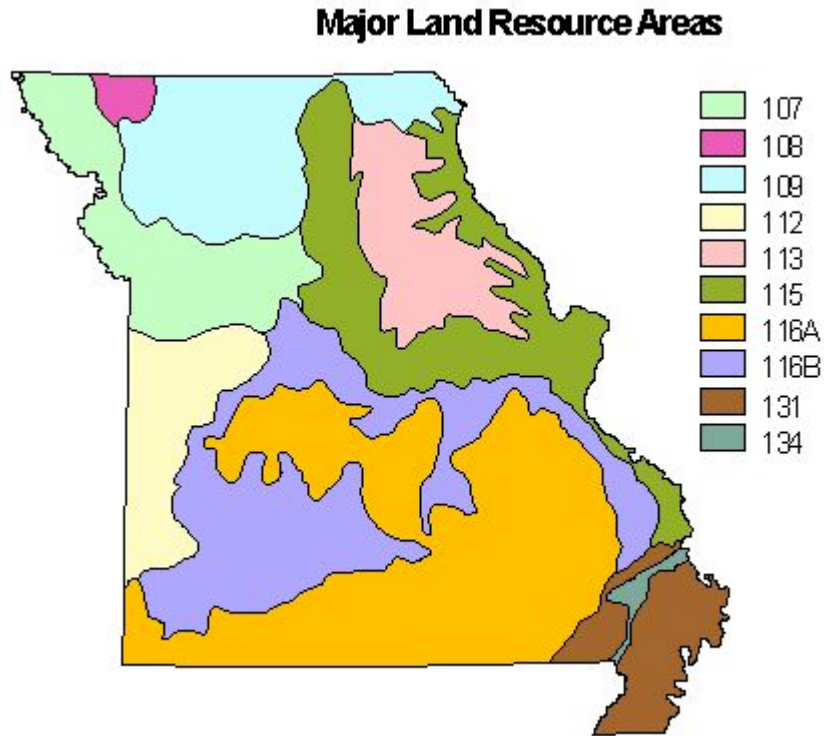


- 1/ Preliminary.
- 2/ Inventory on hand January 1, 2002.
- 3/ Inventory on hand December 1, 2001.
- 4/ Inventory on hand December 1, 2001 (excludes commercial broilers).



## Appendix C.

### Selected National Resources Inventory (NRI) Data For Missouri - USDA



- 107 – Missouri and Iowa Deep Loess Hills
- 108 – Illinois and Iowa Deep Loess and Drift
- 109 – Iowa and Missouri Heavy Till Plain
- 112 - Cherokee Prairies
- 113 – Central Claypan Areas
- 115 – Central Mississippi Valley Wooded Slopes
- 116 – Ozarks
- 131 – Southern Mississippi Valley Alluvium
- 134 – Southern Mississippi Valley Silty Uplands

**SUBJECT: SOIL EROSION**

**CATEGORY: USLE – RELATION TO “T” VALUE\***

**QUALIFIERS: 1997 CULTIVATED CROPLAND**

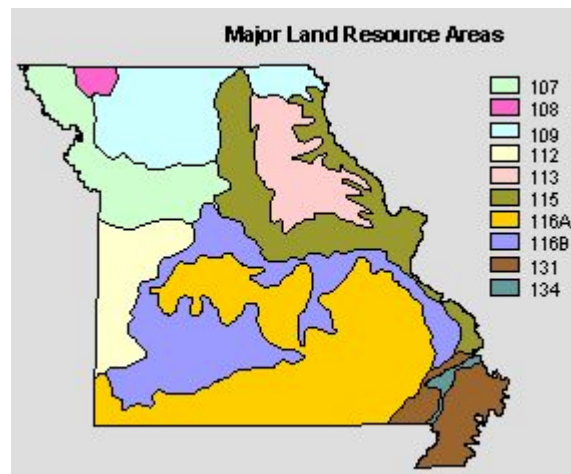
**REPORTING UNIT: AREA (ACRES IN THOUSANDS)**

**GEOGRAPHIC AREA: MISSOURI’S MAJOR LAND RESOURCE AREAS**

**TABLE: MLRA’S RANKED BY TOTAL ACRES IN “T” CATEGORIES**

RANK	> 0 <= T mlra-acres	> T <= 2T mlra-acres	>2T <= 3T mlra-acres	>3T <= 4T mlra-acres	>4T <= 5T mlra-acres	> 5T mlra-acres
1	131-2020	113-467	113-211	109-141	107-80	109-193
2	107-1227	107-367	115-158	107-119	109-61	107-124
3	115-964	112-274	107-156	113-81	113-40	115-99
4	109-825	115-264	109-143	115-57	115-37	113-78
5	112-548	109-259	112-58	112-19	112-13	108-22
6	113-531	116B-155	116B-38	108-13	116B-11	112-18
7	116B-267	131-63	108-8	116B-12	108-5	116B-10
8	108-87	108-25	131-7	134-3	131-3	134-5
9	134-70	134-11	134-5	131-1	134-1	131-4
10	116A-46	116A-7	116A-1	116A-<1	116A -0	116A-1
TOTALS	6585	1892	785	446	251	554

- **USLE – Universal Soil Loss Equation.** This equation estimates average annual soil loss from sheet and rill erosion. Location specific data for the field in which the NRI sample point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculation. **“T” Factor** - The soil loss factor used in conjunction with the USLE. It is the maximum rate of annual soil erosion that will permit crop productivity to be sustained economically and indefinitely. **DATA SOURCE:** 1997 NATIONAL RESOURCES INVENTORY (REVISED DECEMBER 2000)



**SUBJECT: SOIL EROSION**

**CATEGORY: USLE - RELATION TO "T" VALUE\***

**QUALIFIERS: 1997 CULTIVATED CROPLAND**

**REPORTING UNIT: AREA (ACRES IN THOUSANDS)**

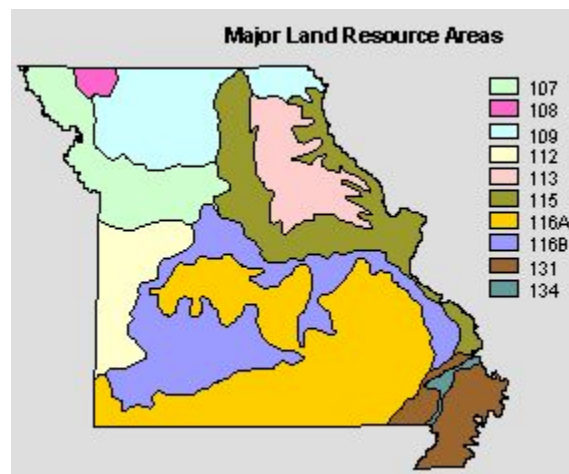
**GEOGRAPHIC AREA: MISSOURI'S MAJOR LAND RESOURCE AREAS**

**TABLE: MLRA'S RANKED BY TOTAL ACRES OF CULTIVATED CROPLAND**

rank	mlra	acres of cultivated cropland	acres eroding above "t"	% of total cultivated cropland in mlra eroding above "t"	% of total cultivated cropland in state eroding above "t"
1	131	2097	78	4%	2%
2	107	2076	846	41%	21%
3	109	1621	797	49%	20%
4	115	1579	615	39%	15%
5	113	1408	877	62%	22%
6	112	930	382	41%	10%
7	116B	492	226	46%	6%
8	108	160	73	46%	2%
9	134	94	25	26%	1%
10	116A	56	9	16%	<1%
TOTALS		10513	3928		

\* **USLE** - Universal Soil Loss Equation. This equation estimates average annual soil loss from sheet and rill erosion. Location specific data for the field in which the NRI sample point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculation. **"T" Factor** - The maximum rate of annual soil erosion that will permit crop productivity to be sustained economically and indefinitely.

**DATA SOURCE:** 1997 NATIONAL RESOURCES INVENTORY (REVISED DECEMBER 2000)



**SUBJECT: SOIL EROSION**

**CATEGORY: USLE - RELATION TO "T" VALUE \***

**QUALIFIERS: 1997 CULTIVATED CROPLAND**

**REPORTING UNIT: AREA (ACRES IN THOUSANDS)**

**GEOGRAPHIC AREA: MISSOURI'S MAJOR LAND RESOURCE AREAS**

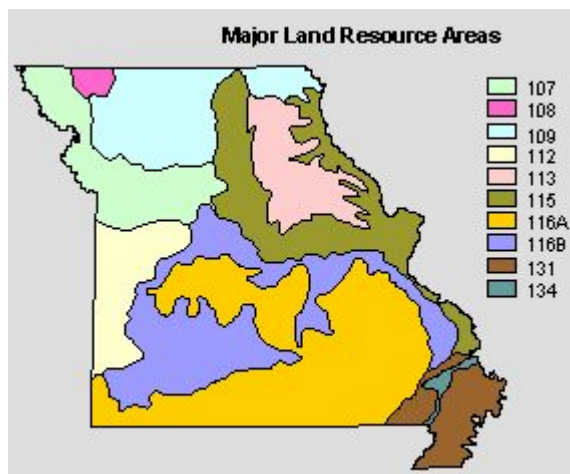
**TABLE: MLRA'S RANKED BY TOTAL ACRES ERODING ABOVE "T"**

rank	mlra	acres eroding above "t"	acres of cultivated cropland	% of total cultivated cropland in mlra eroding above "t"	% of total state cultivated cropland eroding above "t"
1	113	877	1408	62%	22%
2	107	846	2076	41%	21%
3	109	797	1621	49%	20%
4	115	615	1579	39%	15%
5	112	382	930	41%	10%
6	116B	226	492	46%	6%
7	131	78	2097	4%	2%
8	108	73	160	46%	2%
9	134	25	94	27%	1%
10	116A	9	56	16%	<1%
TOTALS		3928	10513		

\* **USLE** - Universal Soil Loss Equation. This equation estimates average annual soil loss from sheet and rill erosion. Location specific data for the field in which the NRI sample point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculation.

**"T" Factor** - The maximum rate of annual soil erosion that will permit crop productivity to be sustained economically and indefinitely.

**DATA SOURCE:** 1997 NATIONAL RESOURCES INVENTORY (REVISED DECEMBER 2000)



**SUBJECT: SOIL EROSION**

**CATEGORY: USLE - RELATION TO "T" VALUE \***

**QUALIFIERS: 1997 BROAD LAND COVER/USE SUBCATEGORIES - CULTIVATED CROPLAND, NONCULTIVATED CROPLAND,\*\* PASTURELAND AND CRP\*\*\***

**REPORTING UNIT: AREA (ACRES IN THOUSANDS)**

**GEOGRAPHIC AREA: MISSOURI**

**TABLE: ESTIMATED AVERAGE ANNUAL SHEET AND RILL EROSION IN RELATION TO "T" VALUE ON SELECTED RURAL LAND COVERS/USES**

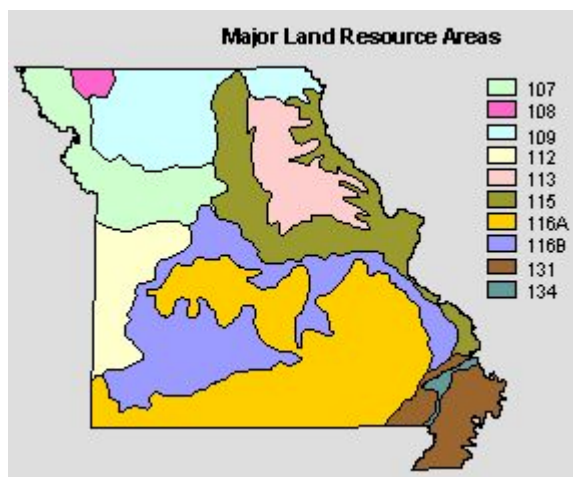
LAND COVER	= 0	> 0 <= T	> T <= 2T	> 2T <= 3T	> 3T <= 4T	> 4T <= 5T	> 5T	TOTAL
Cultivated Cropland	2.6	6583.1	1890.1	784.9	446.1	251.2	555.3	<b>10513.3</b>
Noncultivated Cropland	1.4	3171.8	48.4	8.0	1.3	0.0	3.1	<b>3234.0</b>
Pastureland	11.8	9832.3	658.2	175.1	79.9	52.1	39.3	<b>10848.7</b>
Conservation Reserve Program (CRP)	0.0	1570.0	18.4	3.2	6.5	1.6	6.4	<b>1606.1</b>
<b>TOTAL</b>	<b>15.8</b>	<b>21157.2</b>	<b>2615.1</b>	<b>971.2</b>	<b>533.8</b>	<b>304.9</b>	<b>604.1</b>	<b>26202.1</b>

- **USLE** - Universal Soil Loss Equation. This equation estimates average annual soil loss from sheet and rill erosion. Location specific data for the field in which the NRI sample point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculation. **"T" Factor** - The soil loss factor used in conjunction with the USLE. It is the maximum rate of annual soil erosion that will permit crop productivity to be sustained economically and indefinitely.

**\*\* NONCULTIVATED CROPLAND** - A subcategory of the NRI cropland category. Noncultivated cropland includes permanent hayland and horticultural cropland.

**\*\*\* CRP** - Conservation Reserve Program. A federal United States Department of Agriculture program established under the Food Security Act of 1985 to assist private land owners in converting highly erodible cropland to vegetative cover for 10 years.

**DATA SOURCE: 1997 NATIONAL RESOURCES INVENTORY (REVISED DECEMBER 2000)**



## Appendix D.

TABLE 2. MAJOR WATER POLLUTION SOURCES IN MISSOURI CLASSIFIED WATERS  
(Stream Miles or Lake Acres Impaired)<sup>14</sup>

Source	Stream Miles Impaired	Percent of Total Miles	Lake Acres Impaired	Percent of Total Acres
Agriculture	7,701.9	35	45,138	15
Crop Production/Grazing	7,688.4	35	45,138	15
Confined Animal Feeding Operations	0		0	
Hydromodification	3,775.9	17	11,780	4
Channelization	3,711.4	17		
Flow Regulation/Modific.	43.5	*	11,780	4
Streambank Mod./Destab.	21	*		
Mining	172.3	1		
Municipal and other Domestic Point Sources	87.1	*	43110	15
Urban Runoff and Construction	53.5	*	825	*
Industrial Point Sources	11.6	*		
Landfills	0.3	*		
Recreational Activities	7	*		
Atmospheric Deposition	1,114	5	76,805	26
Natural Sources	162.5	1		
Unknown	5	*	182	*

\* less than 1 %

TABLE 3. MAJOR CONTAMINANTS IN MISSOURI CLASSIFIED WATERS<sup>15</sup>

Contaminant	Stream Miles Impaired	% of Total Miles	Lake Acres Impaired	% of Total Acres
Sediment	7,741.4	35	--	--
Habitat Degradation	3,734.3	17	--	--
Organic Enrichment /Low D.O.	59.5	*	1780	1
Metals	1,444.0	6	86,805	30
Mercury	1,111.0	5	76,805	26
Bacteria	48.5	*	137	*
Ammonia	18.3	*	--	--
Pesticides	24	*	1,385	*
Suspended Solids	8.8	*	--	--
Nutrients	7.4	*	44,578	15
TDS: Sulfate, Chloride	39	*	--	--
Flow Alterations			50	*
Chlorine	0.4	*		
pH	13.3	*		
Thermal Modification	1.4	*		
Unknown	21.7	*		

\* less than 1 %.

NOTE: Many stream miles in Missouri are affected by more than one pollution source or pollutant; therefore, total miles/acres in Tables 2 and 3 can exceed miles/acres in Table 1.

## Appendix E

### Public Drinking Water Grants

<u>District(s)</u>	<u>Drinking Water System(s)</u>	<u>Lake Name(s)</u>	<u>Grant awarded</u>	<u>Grant awarded and accepted</u>	<u>Grant Amount</u>	<u>Acres Requested</u>
Barton	Lamar	Lamar City Lake		X	\$6,810	75
Caldwell	Hamilton	Hamilton Lake		X	\$26,951	250
	Breckenridge	Breckenridge Lake			\$9068	89
Chariton	Marceline	Marceline Lake		X	\$56,066	498
Clinton/Clay/	Smithville	Smithville Reservoir		X	\$500,000	6,000
Dekalb	Plattsburg	Smithville Reservoir			\$228,861	
	Maysville	Willowbrook Lake, West lake, South Lake			\$19,738	179
Dekalb	Cameron	Cameron Lake #3 Grindstone Reservoir		X	\$61,095 + \$13,000 local funds	667
Harrison	Bethany	Harrison County Lake Bethany Reservoir			\$15,905	149
	Harrison Co. PWSD #1				\$1,642	16
Lafayette	Concordia	E A Pape Lake		X	\$116,303	1,123
	Higginsville	Higginsville Lake		X	\$17,618	159
Macon/Adair	Macon	Long Branch Lake		X	\$460,894	4,671
Monroe/Ralls	Monroe City	R.t J Lake, South Lake			\$3009	30
Montgomery	Wellsville	Sportsman Lake		X	\$6,059	50
Pike	Vandalia	Vandalia Lake		X	\$8,038	87
	Bowling Green				\$9,646	87
Shelby	Shelbina	Shelbina Lake		X	\$11,159	119